

LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE.—XVIII.

BY HARRISON G. DYAR, WASHINGTON, D. C.

Haematopis grataria Fab. Riley has described the mature larva and pupa and given a short account of the habits, which has been quoted by Packard.

Egg. Laid in a row side by side on the edge of a leaf or stem. Elliptical, flattened above and below, wedge shaped, the larger end moderately truncate; marked like a thimble all over, the reticulations broad and rounded, the cell areas depressed, forming rounded shallow pits. The pores at the angles of the reticulations show in certain lights as white dots. Pale yellow, later turning red. Size $.6 \times .4 \times .3$ mm.

Stage I. Head rounded, slightly bilobed, erect, free, dull black, the face whitish, irregularly bordered, looking like four confluent patches about the clypeus; antennae small; width about .25 mm. Body moderate, normal; white, a little sordid; a broad reddish brown subdorsal band, becoming, behind joint 5, a broad single dorsal band, cut on each segment by a posterior cuneiform patch of the ground color dorsally and a small anterior one subdorsally on each segment. A similar broad subventral band, more diffuse and a little paler, the pair obscurely joining in the centers of the medial segments. Tubercles small, dark; setae short, slightly enlarged at tips; shields uncornified, concolorous; feet pale.

Stage II. Head squarish bilobed, a distinct shallow vertical notch; free, higher than joint 2; brown mottled, a white patch across the lower part of clypeus, a yellowish white vertical band and broader, irregularly edged patch behind the ocelli; width .35 mm. Body somewhat thick, the segments slightly enlarged centrally and a little angularly bent, subannulate, tubercles and setae obsolete. Greenish white, marked with dark reddish brown. At the ends a broad sub-

dorsal band, obscurely geminate, becoming centrally a series of large V marks, one on a segment, the points directed forward, joined by narrow addorsal and subdorsal lines, in all five such marks, situated on joints 5 to 9. Sides slightly marked with olivaceous in the folds. A broad subventral band, obscurely darker, running the whole length and partly olivaceous, not so sharply defined as the dorsal marks. Feet pale outwardly. A dark lateral shade on joint 5.

Stage III. Head as before, the brown color darkened, spotted, the light color yellowish-white; width .55 mm. Body yellowish white in ground, but largely obscured. Subdorsal line pale brown, sharply, though a little pulverulently edged, continuous, obscurely cutting the oblique, velvety brown bars of joints 5 to 9, into which the former V-marks are now divided. Lateral band velvety brown, representing the oblique bars at the extremities. A faint, geminate, pale brown, stigmatal band, composed mostly of the prolongations posteriorly of the oblique bars, but a true line at the extremities. Subventral band broad, pulverulently geminate, dark brown, widened above centrally on the segments, especially on joint 5, where it forms a large spot. Feet pale outwardly. Tubercles and setae obsolete. Body moderate, rather robust, the segments slightly swollen centrally.

Stage IV. Head rounded, squarish above, broad, lobes full at cheeks, held obliquely, free from and higher than joint 2; densely dotted with blackish brown, leaving a small white vertical streak on the lobe and a space behind the ocelli, the latter reticulate; width .8 mm. Body moderate, a little tapering before, not so behind, marked as before, but the brown marks darker and more extensive so that this color predominates, making the

larva look brown with greenish white lines, of which the central obliques, bordering the oblique brown patches below and that on the subventral fold are most distinct. Dorsal line obscurely geminate, pale.

Stage V. Head as before; width 1.25 mm. Body also as before, moderate, cylindrical, thorax and central abdominal incisions smaller, anal plate rounded, a little projecting, anal feet thickly triangular. Heavily mottled with black brown; dorsal line obscurely geminate, lighter brown; subdorsal obliques from subdorsum anteriorly

to spiracle on joints 6 to 9, yellowish white, broken; a similarly colored, longitudinal, broken stigmatal and subventral line, two faint lines in subventral space and a distinct medioventral one, all somewhat pulverulent and brown dotted. Feet dark, the anal ones only pale outwardly. When disturbed the larvae fall and remain motionless extended straightly. Cocoon a large delicate net in which the pupa is suspended. Many brooded; larvae from Washington, D. C. They fed readily on *Polygonum rayi* and were raised on this plant.

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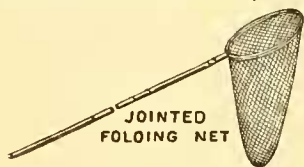
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